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L9: Entry 7 of 19

File: USPT

Aug 26, 2003

DOCUMENT-IDENTIFIER: US 6611867 B1

TITLE: System, method and article of manufacture for implementing a hybrid network

Detailed Description Text (82):

The major IN requirements include session establishment, advanced call processing, call routing and call treatment (network messages and call termination). Examples of applications and features are the CLASS family of services (Call waiting, Call forwarding, Conference calling, Call rejection), enhanced call routing, Number Portability, Calling Card Services, and Audio delivered Information Services (e.g. travel, stocks and weather).

Detailed Description Text (157):

FIG. 1G-1 is a flowchart illustrating Rating and Discounting Process in accordance with a preferred embodiment. First, in step 185, hybrid network customer usage information is received. In step 186, network service level agreement violations are collected, and, in step 187, network quality of service violations are received by the Rating and Discounting system. Next, in step 188, rating rules are applied to the network customer usage information. Further, in step 189, negotiated discounts are determined based on the network quality of service violations and, in step 190, rebates are determined based on the network service level agreement violations. Thereafter, in step 191, billing data reflecting the usage information, the negotiated discounts, and the rebates is provided to generate a customer invoice.

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L9: Entry 11 of 19

File: USPT

Mar 18, 2003

DOCUMENT-IDENTIFIER: US 6535593 B1

TITLE: System and method for billing communications services provisioned on demand in converging telecommunications network

Drawing Description Text (5):

FIG. 2B is a screen shot of a user interface (UI) screen manifested as a Java Applet within a web browser application to facilitate telecommunications service provisioning in accordance with a preferred embodiment of the present invention and, in particular, pre-paid calling card/PIN services such as batch processing maintenance related to activating whole batches of card accounts based on customer specifications established via a web connection and in real time;

Detailed Description Text (12):

Referring now to FIG. 2B, depicted therein is a screen shot of a user interface (UI) screen manifested as a Java Applet within a web browser application (such as the NETSCAPE COMMUNICATOR v.4.x web browser) to facilitate telecommunications service provisioning in accordance with a preferred embodiment of the present invention and, in particular, pre-paid calling card/PIN services such as batch processing related to activating whole batches of card accounts based on customer specifications established via a web connection and in real time. In particular, screen shot 250 includes a Java Applet based UI 252 that is configured to permit data entry by a user (a service customer) to engage in a telecommunications function such as batch maintenance related to whole batches of pre-paid communications accounts (e.g., calling cards, etc.). The data values collected and validated in accordance with UI 252 are used to drive the database operations performed at least in part within system 100 (FIG. 1) by database facilities DB. That is, client-based UI 252 is configured to drive back-end database management processing such as database propagation, queries, reporting, etc. The implementation of such back-end operations will be immediately understood by those skilled in the art after reviewing this patent document. Accordingly, the present invention now permits customers such as stores to custom purchase and acquire pre-paid communications accounts, etc. on-demand and through use of automated user interfaces which are accessible via the Internet and web.

Detailed Description Text (14):

Referring now to FIG. 2D, depicted therein is a screen shot of a consolidated billing notice provided within a web browser application in accordance with a preferred embodiment of the present invention. In particular, screen shot 260 is a web page provided via a web connection which includes a consolidated billing notice 262 for a fictitious customer NETFOUR CORP. As show, consolidated billing notice 262 includes data related to actual prepaid account usage by customers of NETFOUR CORP. Within consolidated billing notice 262 are billing lines that correspond to billing data generated by at least one telecommunications device (e.g., database facilities like or similar to database facilities DB, IVRU units, switches, etc.) in system 100 (FIG. 1).

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L14: Entry 2 of 35

File: PGPB

Jan 23, 2003

DOCUMENT-IDENTIFIER: US 20030016798 A1

TITLE: System and method for billing communications services provisioned on demand in converging telecommunications networks

Abstract Paragraph:

System and method for facilitating consolidated billing within a converging telecommunications network. The system and method include and involve a network resource control facility communicating with and controlling a plurality of network resources within a merged telecommunications network to deliver at least one merged communications service. Each network resource is configured to provide a communications function and to generate corresponding billing data. The network resource control facility is configured to consolidate the billing data from at least one network resource from the plurality of network resources in real-time related to at least one telecommunications service provided within said telecommunications network to generate consolidated billing data. The system and method further include an interface facility which is accessible via a network connection and which is configured to access the network resource control facility to receive the consolidated billing data to produce a consolidated billing notice related to the telecommunications service(s) that are provided.

Summary of Invention Paragraph:

[0004] Today's telecommunications industry is a crowded one in which customers and service providers are being increasingly linked together via converging networks, such as in the case of converging voice and data networks. As such, a growing trend to make communications services available over publicly accessible networks such as the Internet increases the need for open, multi-vendor, multi-protocol networks and systems. Such a trend has been realized as result of the fact that service providers and others have found that closed, single-vendor, single-protocol networks are, difficult, if not impossible, to create and manage, are not scalable to meet future communications needs, and do not permit consumers to self-direct their communications needs.

Summary of Invention Paragraph:

[0007] Another problem facing consumers and telecommunications providers alike, is the inability to provide consolidated billing and accounting information to facilitate purchasing and supplying of telecommunications services. Such problems are exacerbated when thought of in the context of converging networks where many different types of transport across many different network layers supporting voice and data applications may be custom-linked to service a particular customer need. While some vendors such as MCI/MCI WORLDCOM, INC. have offered "one" type billing systems wherein consolidated billing and accounting information related to a host of services (e.g., voice bandwidth, data bandwidth, cellular) purchased by a particular a customer is made available to that customer, such systems typically are single-vendor based, are directed to a single, particular customer, and merely refer to purchases of pre-configured service offerings. Such prior consolidated billing schemes offered no way of consolidating billing and accounting information related to one or more services that, in fact, are custom configured based on a particular customer's on-demand provisioning choices, etc.

Summary of Invention Paragraph:

[0008] Thus, there exists a need to provide new and improved systems and methods to provision network resources in converging telecommunications networks such as converging voice and data networks to deliver merged, services based on customer needs on demand, and, thus, to consolidate billing and accounting data related to such merged services. To be viable such systems and methods must support legacy systems and integrate new technologies seamlessly so that consumers of telecommunications services can obtain a breadth of feature rich services and receive consolidated billing and accounting statements. Such systems and methods must support various network technologies, facilitate communications within multi-protocol networks, and permit consolidated billings and accounting schemes. And, such new and improved systems and methods must permit consumers of telecommunications services to self-provision and self-direct their telecommunications services from within easily usable interfaces such as Internet and web based interfaces that support communications service provision on demand.

Summary of Invention Paragraph:

SUMMARY OF THE INVENTION

Summary of Invention Paragraph:

[0010] The present invention solves the aforementioned problems and provides new and improved systems and methods for integrating network resources within converging telecommunications networks to provision communications services and to consolidate billing data generated by disparate telecommunications devices. Such systems and methods are capable of enabling providers of services to link with other providers seamlessly to provide enhanced services over voice and data networks especially over publicly accessible networks such as the Internet. Consumers of telecommunications services will benefit from the present invention by obtaining greater control over their communications needs and, in particular, will gain the ability to self direct and self-provision the services they need, and the ability to receive consolidated billing notices and the like.

Summary of Invention Paragraph:

[0011] The present invention solves the aforementioned problems and delivers the above-stated benefits by providing new and improved systems and methods for facilitating consolidated billing within a converging telecommunications network. The system and method include and involve a network resource control facility communicating with and controlling a plurality of network resources within a merged telecommunications network to deliver at least one merged communications service. Each network resource is configured to provide a communications function and to generate corresponding billing data. The network resource control facility is configured to consolidate the billing data from at least one network resource from the plurality of network resources in real-time related to at least one telecommunications service provided within said telecommunications network to generate consolidated billing data. The system and method further include an interface facility which is accessible via a network connection and which is configured to access the network resource control facility to receive the consolidated billing data to produce a consolidated billing notice related to the telecommunications service(s) that are provided.

Brief Description of Drawings Paragraph:

[0014] FIG. 1 is a diagram of a system in which telecommunications services may be provisioned and in which consolidated billing and accounting data may be generated and collected based on customer requests received in real time and on-demand;

Brief Description of Drawings Paragraph:

[0016] FIGS. 2B is a screen shot of a user interface (UI) screen manifested as a Java Applet within a web browser application to facilitate telecommunications service provisioning in accordance with a preferred embodiment of the present invention and, in particular, pre-paid calling card/PIN services such as batch processing maintenance related to activating whole batches of card accounts based

on customer specifications established via a web connection and in real time;

Detail Description Paragraph:

[0021] Referring now to FIG. 1, depicted therein is a diagram of a system in which customers may access a merged telecommunication network to receive merged telecommunications services in accordance with a preferred embodiment of the present invention. In particular, system 100 includes a merged telecommunications network which may include at least portions of a global network, the publicly switched telephone network (PSTN), the Internet (and world wide web), etc. Moreover, system 100 may include vendor communications systems V1 through V6 (among others), wherein each vendor system may include switching systems, interactive voice response units, control facilities and database management facilities, interfacing facilities and a host of other telecommunications devices found in modern telecommunications networks and which may be accessed in merged telecommunications network 102 using a variety of modern communications protocols and device messaging schemes.

Detail Description Paragraph:

[0022] In system 100, a calling party such as calling party CP may utilize calling services through a central office 114 which is coupled to merged telecommunications network 102 to receive telecommunication services based upon communications functions provided by telecommunications devices such as those provided by vendors V1-V6. For example, a particular telecommunications service may include the operations of a router such as router 112 in the context of data based telecommunications services, voice response services, such as those provided by vendor V5 via IVRU unit 108, gateway services provided by gateway system 122 which is provided by vendor V6, etc. Moreover, telecommunications services may include voice calls which ultimately terminate at a called party such as CEDP party via central office 116. Furthermore, customer systems C1 and C2 may incorporate multimedia telecommunications systems including computing platforms that facilitate multimedia communications via merged telecommunications network 102. Such services may be provided via vendor systems V1, V3 along with an Inter-Exchange Carrier system denoted by system IXC (denoted by phantom lines forming a box around a vendor network that includes interactive voice response unit (IVRU) 124 and a switching platform 126).

Detail Description Paragraph:

[0023] Within system 100, vendor V3, for example, is shown to include control facilities, database management facilities and an interfacing facility. The control facilities in conjunction with the database facilities and the interfacing facility, permit customers to custom configure (self-direct) telecommunications services on demand and in real time (e.g., during normal business operations) via couplings made automatically within the merged telecommunications network 102. For example, interfacing facility IF of vendor system V3 may incorporate switching facilities 118, 119, and 120 along with IVRU facilities 108 to provide a custom configured telecommunications service in real time. That is, each communications function provided by a particular telecommunications device or facility within system 100 may be treated as an inventory item within merged telecommunications network 102, for example, to facilitate custom configuration of telecommunications services on demand and based on customer requirements. Accordingly, a customer such as customer C2 may access merged telecommunications network 102 and ultimately, interfacing facility IF of vendor system V3 to custom configure bandwidth allocation services on demand and in real time without the need to request such services in advance and via live operator intervention. Accordingly, customer C2 may access an ISP system 110 to provide access to merged telecommunications network 102, for example, to engage the operations of interfacing facility IF of vendor system V3 in the abstract so that in the event that communications functions provided by disparate telecommunications devices are needed to fulfill a particular customer request, it then can be provisioned in the abstract without requiring the customer to specifically understand or be able to message to possibly disparate

telecommunications devices. Furthermore, a customer requiring merged voice and data type communications services now may access a merged telecommunication network in consideration of the present invention to ultimately access IXC services, such as voice response and switching services provided IVRU facilities 124 and switching facilities 126 in combination with other services provided within merged telecommunications network 102 to provision enhanced telecommunications services on demand and in real time based upon specific customer specifications.

Detail Description Paragraph:

[0024] Furthermore, the interfacing facilities provided by vendor V3, for example, permit telecommunications devices and facilities within merged telecommunications network 102 to transmit billing and accounting data related to the provision telecommunications services to a central or otherwise consolidated data facility such as data facility 104 which includes interfacing facilities, control facilities and database facilities, and to ultimately, provide such consolidated billing data to a customer for appropriate processing thereby. For example, in the event that extended or extra bandwidth is a telecommunications service to be provided within merged telecommunications network 102 at the request of a customer in real time, such extended bandwidth may require certain switching facilities, such as switching facility 118, and switching facility 119, to be including in the provision of that particular bandwidth telecommunications service. Accordingly, the present invention now permits switching system 118 and switching facility 119, for example, to transmit billing data to a consolidated billing facility whereby billing data, possibly incorporating billing data generated by disparate telecommunications devices (e.g., devices communicating and messaging in accordance with disparate telecommunications protocols, etc.), communicating in accordance with disparate protocols and messaging schemes, to be consolidated and ultimately reported within a single or consolidated notice or message provided via merged telecommunication network 102.

Detail Description Paragraph:

[0027] Data processing system DP is configured to receive and transmit data to and from network facilities, customer systems, vendor systems, etc. via modern telecommunications protocols including, but not limited to, those used in SS/7 out-of-band signaling systems, TCPIP protocols, H.323 communications protocols, and any other telecommunications protocols which may used to facilitate messaging between telecommunications devices in accordance with the present invention.

Detail Description Paragraph:

[0028] Data storage subsystem 204 as shown within data processing system DP, will include internal and external messaging conversion mappings and translations, which may be used to convert device specific messages (external messages) generated by specific telecommunications devices within merged telecommunications network 102 (FIG. 1) into internal messages (IMs) which are device independent which may be used to consolidate application type data to including billing operation data etc. Data storage subsystem 204 may store and provide telecommunications device (TCD) inventory data about particular telecommunication devices in merged telecommunications network 102. And, data storage subsystem 204 may including billing data generated based on service provisioning and, in particular, billing data generated by particular telecommunications devices within merged telecommunications network 102.

Detail Description Paragraph:

[0029] Referring now to FIG. 2B, depicted therein is a screen shot of a user interface (UI) screen manifested as a Java Applet within a web browser application (such as the NETSCAPE COMMUNICATOR v.4.x web browser) to facilitate telecommunications service provisioning in accordance with a preferred embodiment of the present invention and, in particular, pre-paid calling card/PIN services such as batch processing related to activating whole batches of card accounts based on customer specifications established via a web connection and in real time. In

particular, screen shot 250 includes a Java Applet based UI 252 that is configured to permit data entry by a user (a service customer) to engage in a telecommunications function such as batch maintenance related to whole batches of pre-paid communications accounts (e.g., calling cards, etc.). The data values collected and validated in accordance with UI 252 are used to drive the database operations performed at least in part within system 100 (FIG. 1) by database facilities DB. That is, client-based UI 252 is configured to drive back-end database management processing such as database propagation, queries, reporting, etc. The implementation of such back-end operations will be immediately understood by those skilled in the art after reviewing this patent document. Accordingly, the present invention now permits customers such as stores to custom purchase and acquire pre-paid communications accounts, etc. on-demand and through use of automated user interfaces which are accessible via the Internet and web.

Detail Description Paragraph:

[0031] Referring now to FIG. 2D, depicted therein is a screen shot of a consolidated billing notice provided within a web browser application in accordance with a preferred embodiment of the present invention. In particular, screen shot 260 is a web page provided via a web connection which includes a consolidated billing notice 262 for a fictitious customer NETFOUR CORP. As show, consolidated billing notice 262 includes data related to actual prepaid account usage by customers of NETFOUR CORP. Within consolidated billing notice 262 are billing lines that correspond to billing data generated by at least one telecommunications device (e.g., database facilities like or similar to database facilities DB, IVRU units, switches, etc.) in system 100 (FIG. 1).

Detail Description Paragraph:

[0033] Referring now to FIG. 3, depicted therein is a flow chart that illustrates the operations that may be carried out within system 100 to facilitate the provisioning and corresponding consolidated billing operations related to such provisioning of customer configured telecommunications services provided in real time and in accordance with the preferred embodiments of the present. In particular, processing and operations start at step S3-1 and immediately proceed to step S3-2. At step S2, a determination will be made as to what network/communication services are to be provided based upon a customer specifications.

Detail Description Paragraph:

[0034] Next, as step S3-3, interfacing facilities (IF) along with control facilities and database facilities as shown within system 100 identify the network resources and in particular, the specific telecommunications devices within merged telecommunications network 102, to be configured and controlled to provision the services specified by the customer.

Detail Description Paragraph:

[0035] Next, at step S34, interfacing facilities (IF) along with control facilities and database facilities as shown within system 100 will configure the network resources via corresponding messaging (e.g., generation of device-specific messages that are used to control and provision devices within a network system) identified at step S3-3 in real time and based on customer specifications.

Detail Description Paragraph:

[0036] Next, at step S3-5, the services which are custom configured and specified by the customer will be provisioned.

Detail Description Paragraph:

[0037] Next, at step S3-6, billing data will be collected from the configured and controlled network resources (e.g., the specific devices and facilities within merged telecommunications network used to provision the desired services), and in particular, the specific telecommunications devices used to provision the services

specified by the customer. Such billing data will often be device specific type billing data which may be transmitted to a central billing facility such as billing facility 104 which may be operated by vendor V3 as shown in system 100. Once such consolidated billing data is collected, the same may be manipulated in a consolidated format such as via common database operations--which operate upon data stored within common tables regardless of the originating data source. The present invention, via use of interfacing facilities IF, permit such common data collection via translations of device specific messages (e.g., external messages) into internal messages which may include device related operations, data operations, etc.

Detail Description Paragraph:

[0038] Next, at step S3-7, consolidated billing data will be generated based upon, the data collected during processes illustrated at step S3-6. Such consolidated data may include consolidated table, queries, etc. Any type of data structure which may be used to provide a common data messaging interface may be used within the context of the present invention.

Detail Description Paragraph:

[0040] An additional step, step, S3-9, may be added to the processes and operations illustrated within FIG. 3 to point out that a customer may access interface facility IF within system 100 to carryout the processes illustrated within the flow chart shown in FIG. 3. Such access may occur via a customer system and a network connection such as one which accesses a global network like or similar to the Internet and WWW. Such access may occur via customer system C2 which may be linked to the merged telecommunication network 102 via the Internet.

CLAIMS:

1. A system for facilitating consolidated billing within a converging telecommunications network, comprising: a network resource control facility communicating with and controlling a plurality of network resources within a merged telecommunications network to deliver at least one merged communications service, each network resource of said plurality of network resources configured to provide a communications function and to generate corresponding billing data, said network resource control facility configured to consolidate said billing data from at least one network resource from said plurality of network resources in real-time related to at least one telecommunications service provided within said telecommunications network to generate consolidated billing data; and an interface facility accessible via a network connection and configured to access said network resource control facility to receive said consolidated billing data to produce a consolidated billing notice related to said at least one telecommunications service.
2. The system according to claim 1, wherein said communications service includes dynamic allocation of bandwidth provided by said at least one network resource, said consolidated billing data including billing data related to bandwidth allocation.
3. The system according to claim 1, wherein said communications services includes voice and data network resources from said plurality of network resources, said consolidated billing data including billing data related to voice and data communication functions.
9. The system according to claim 1, wherein said consolidated billing notice includes references to billing data provided by at least one telecommunications provider based on allocation of said at least one network resource.
12. A system for provisioning on-demand communications services and for consolidating billing data related to said services, comprising: a network management facility communicating with and controlling disparate telecommunications

devices within a telecommunications network, wherein said network management facility automatically configures and controls said disparate telecommunications devices within said network in real-time; a database facility storing inventory data related to said disparate telecommunications devices within said network, said database facility also storing billing data generated by each of said disparate telecommunications devices; and an interface accessible via a network connection, coupled to said database facility and configured to access said network management facility via said network and to provision at least one of said disparate telecommunications devices to provide at least one communication service on-demand and in real-time based upon corresponding inventory data stored by said database facility, and to access said database facility to consolidate said billing data to generate a consolidated billing message.

14. The system according to claim 12, wherein said communication service includes bandwidth allocation to an Internet customer.

20. The system according to claim 12, wherein said consolidated billing message is made available to a customer via the Internet.

21. The system according to claim 12, wherein said consolidated billing message includes billing data generated by a plurality of telecommunications devices based on said at least one communications service.

22. The system according to claim 12, wherein said consolidated billing notice includes references to billing data provided by at least one telecommunications provider corresponding to said at least one telecommunications device.

25. A method for self-provisioning and billing for communications services within a merged telecommunications network, comprising the steps of: determining a communications service to be provided; automatically identifying network resources within a merged telecommunications network to be configured and controlled to provide said communications service; automatically configuring said network resources in real-time to provide said communications service; collecting billing data generated by each network resource configured to provide said communications service; and generating a consolidated billing data based on said billing data generated by each network resource configured to provide said communications service.

26. The method according to claim 25, further comprising the step of storing said consolidated billing data to be accessible via said telecommunications network.

27. The method according to claim 25, further comprising the step of storing said consolidated billing data to be accessible via the Internet.

28. The method according to claim 25, wherein said consolidated billing data includes data generated by at least one service provider in real time and during the provision of said communications service.

29. The method according to claim 25, further comprising the steps of: accessing an interfacing facility to determine said network resource to be provided during said determining step; and permitting a customer to carry out said accessing step.

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L14: Entry 3 of 35

File: PGPB

Sep 19, 2002

DOCUMENT-IDENTIFIER: US 20020133328 A1

TITLE: CUSTOMER-DRIVEN QOS IN HYBRID COMMUNICATION SYSTEMAbstract Paragraph:

According to a broad aspect of a preferred embodiment of the invention, a Customer Quality of Service Management system is provided. First, a hybrid network event is received which may include customer inquiries, required reports, completion notification, quality of service terms, service level agreement terms, service problem data, quality data, network performance data, and/or network configuration data. Next, the system determines customer reports to be generated and generates the customer reports accordingly based on the event received.

Summary of Invention Paragraph:

[0001] The present invention relates to hybrid communication networks and more particularly to customer quality of service management in an hybrid communication system architecture.

Summary of Invention Paragraph:

SUMMARY OF INVENTION

Summary of Invention Paragraph:

[0003] According to a broad aspect of a preferred embodiment of the invention, a Customer Quality of Service Management system is provided. First, a hybrid network event is received which may include customer inquiries, required reports, completion notification, quality of service terms, service level agreement terms, service problem data, quality data, network performance data, and/or network configuration data. Next, the system determines customer reports to be generated and generates the customer reports accordingly based on the event received.

Brief Description of Drawings Paragraph:

[0008] FIG. 1C shows a block diagram of the Customer Interface Management Process in accordance with a preferred embodiment;

Brief Description of Drawings Paragraph:

[0009] FIG. 1C-1 is a flowchart illustrating a Customer Interface Management Process in accordance with a preferred embodiment;

Brief Description of Drawings Paragraph:

[0010] FIG. 1D shows a block diagram of the Customer Quality of Service Management Process in accordance with a preferred embodiment;

Brief Description of Drawings Paragraph:

[0011] FIG. 1D-1 is a flowchart illustrating a Customer Quality of Service Management Process in accordance with a preferred embodiment;

Brief Description of Drawings Paragraph:

[0040] FIG. 18 is a flowchart showing a three tiered customer support process in accordance with a preferred embodiment of the present invention;

Detail Description Paragraph:

[0063] Some data communication networks involve a variety of different customers each of whom makes available a host and one or more databases to its users, and may place a level of security on its database which differs from the level placed by other customers on their respective hosts and databases. In those instances, it is customary to make the host responsible for security and access to itself and its associated database. Thus, a user might have access to certain destinations in the network without restriction, but no access to other destinations.

Detail Description Paragraph:

[0065] According to Yankee Group Research, network management costs continue to increase, with network managers spending an average of 45 percent of their budget on ongoing network management, 20 percent on equipment, and 35 percent on network transport services. It is a constant battle to reduce these costs yet somehow improve overall service to their customers. Reducing overall network management costs can be very difficult in today's business environment. Networks continue to become more complex, with more and more demands being placed on the network managers and planners. For example, the exponential growth of remote access has made their jobs more difficult, as the requirement to establish and manage connections for remote offices and telecommuters is often required without additional personnel or budget resources. Unfortunately, network managers and planners spend so much time in "firefighting" mode, trying to support their complex networks, that very little time is actually spent planning for network growth and enhancements. Combined with this is the fact that it is becoming difficult to keep highly skilled employees given the demand for certain skills in the marketplace, and the premiums that will be paid for those skills. So, what is a network manager to do? More and more, they are looking outside for help.

Detail Description Paragraph:

[0066] The market for customer network management services is generally referred to as Managed Networked Services (MNS). Yankee Group estimates this market will estimated to grow from \$3 B to 9 B within the next three years. MNS became the focus of service providers in 1995 as they saw revenues for frame relay network services double for two years in a row. What began as a way to boost the popularity of frame relay services by offering to lease and manage routers has blossomed into a diverse set of services that are now closer to those associated with outsourcing. Yankee Group research shows that 37 percent of Fortune 1000 managers are already outsourcing or plan to outsource their ongoing network operations management. In addition, it is the communications provider that is thought of as the most likely provider for one-stop shopping services.

Detail Description Paragraph:

[0095] The people vision for the NM/MNS include an organization model for customer service support, the corresponding roles and responsibilities for this organization model and a conceptual design for workforce transformation to packet switching.

Detail Description Paragraph:

[0096] Customer Service Support

Detail Description Paragraph:

[0097] Customer service support provides a single point of contact that is customer focused. This single point of contact provides technical expertise in resolving customer incidents, troubles and requests. Generally a three tiered support structure is optimal for satisfying customer service needs. Each tier, or level, possesses an increasing level of skill, with tasks and responsibilities distributed accordingly. Such a structure is as follows:

Detail Description Paragraph:

[0098] Tier 1--typically has a broad set of technical skills and is the first level of support to the customer. Typically this group is responsible for resolving 60-70 percent of the opened problems.

Detail Description Paragraph:

[0103] In this model, users are requested to contact different areas (via VRU) depending on the nature of the incident. Calls are routed to the customer support representative best able to handle the call. This model can easily be coupled with the Skilled Model, and has been at previous client engagements.

Detail Description Paragraph:

[0108] Web-Based SLA Reporting Tool--is a browser based tool that provides the personalized SLA reports to customers in both a template and ad-hoc format.

Detail Description Paragraph:

[0110] Customer to Event Mapping Module--Add-on module to the Managed Networked Services Integrated Solution which maps network element events, to service offerings, to customers. This tool allows the Customer Service Representative to proactively address network outages with customers.

Detail Description Paragraph:

[0145] The major IN requirements include session establishment, advanced call processing, call routing and call treatment (network messages and call termination). Examples of applications and features are the CLASS family of services (Call waiting, Call forwarding, Conference calling, Call rejection), enhanced call routing, Number Portability, Calling Card Services, and Audio delivered Information Services (e.g. travel, stocks and weather).

Detail Description Paragraph:

[0149] With the rapid explosion of the Internet, and innovation in packet based technologies, the IP based data network has become the dominant network in terms of user traffic, and its growth is slated to continue exponentially. This phenomenon has created a dilemma for traffic planners and engineers of the Core network. They have seen traffic grow on the access portions of their networks (PSTN) but have realized very little financial benefits from this usage because third party service providers have been the termination point of these internet data users. The incumbents have begun to devise intelligent network solutions for this data traffic (example RAS with SS7 gateway) in order to solve two major challenges: 1) off loading data traffic from the voice infrastructure to alleviate the congestion issues that face traditional voice customers and 2) collecting revenues from the third party data services providers (ISP's) for access and routing callers to their Points Of Presence.

Detail Description Paragraph:

[0150] Due to the high growth in IP and other data services, many new service providers have emerged that are building only IP based data networks, and provide only IP based data services. Their business strategy is to continue to ride the technological innovation of IP and packet based technologies and build complete suites of services on a packet based infrastructure. Because they are investing in only one form of network (as opposed to many parallel networks), their unit cost of services is low, they are not encumbered by legacy networks and systems, and they can provide cheaper and better services to customers; hence they pose a significant threat to incumbent telecom service providers.

Detail Description Paragraph:

[0154] While there are components in the NGN that ensure interoperability between "NGN" and PSTN, there are also a huge new set of new services that are built entirely on the NGN components which is provide feature rich multimedia (voice, video, data) based communication services as well as enabling many E-Commerce services enabled by IP technologies. These components (described later in detail) include directories, policies, user authentication, registration, and encryption. These components enable services like integrated messaging, multimedia conversations, on-demand multi-point conference, enhanced security &

authentication, various classes of media transport services, numerous automations in electronic internet commerce activities e.g. banking, shopping, customer care, education, etc. As the NGN matures third party value added service providers will develop IP based services that will combine applications such as electronic commerce (procurement, warehousing, distribution and fulfillment) as well as online banking to present the consumer with an integrated boundless shopping experience.

Detail Description Paragraph:

[0177] Provides connectivity and session termination from customer premises to the NGN

Detail Description Paragraph:

[0194] This process or application is critical since it is the "glue" between the end user application and the communications network. It is responsible for collection and distribution of end-user session preferences, application requirements, access device capability and accounting policy information to the required "IN enabling" components. In summary its main functions are to:

Detail Description Paragraph:

[0195] Create the AMA/CDR and other usage records

Detail Description Paragraph:

[0212] The digital network segment that interfaces with the "NGN" comprises of a coaxial cable local loop which is connected to a cable data modulator running QAM/DPSK protocols. The coaxial loop is terminated at the customer premise by an Ethernet cable modem which delivers the IP Tone to the applications (Voice, Video, Data) that may reside on a PC or application server. The cable modems used provide users and applications with a wide range of bandwidth options from 2 to 10 Mbits per second depending on configuration and choice of equipment vendor.

Detail Description Paragraph:

[0235] FIG. 1B shows a block diagram of the Network Data Management 130 in accordance with a preferred embodiment of the present invention. Network Data Management 130 encompasses the collection of usage data and events for the purpose of network performance and traffic analysis. This data may also be an input to Billing (Rating and Discounting) processes at the Service Management Layer, depending on the service and its architecture.

Detail Description Paragraph:

[0236] The process provides sufficient and relevant information to verify compliance/non-compliance to Service Level Agreements (SLA). The process provides sufficient usage information for rating and billing.

Detail Description Paragraph:

[0237] This process ensures that the Network Performance goals are tracked, and that notification is provided when they are not met (threshold exceeded, performance degradation). This also includes thresholds and specific requirements for billing. This includes information on capacity, utilization, traffic and usage collection. In some cases, changes in traffic conditions may trigger changes to the network for the purpose of traffic control. Reduced levels of network capacity can result in requests to Network Planning for more resources.

Detail Description Paragraph:

[0238] FIG. 1B-1 is a flowchart illustrating a network data management process in accordance with a preferred embodiment. First, in step 150, data is collected relating to usage and events occurring over a hybrid network. Next, in step 152, the data is analyzed to determine a status of the hybrid network which in turn, in step 154, is utilized during management of the hybrid network. Further, in step 156, billing rates and discounts are determined based on the status of the hybrid network.

Detail Description Paragraph:

[0239] In addition to the Network Data Management 130 generating billing events, the present invention also uses a Customer Interface Management process 132, as shown in FIG. 1C, to directly interact with customers and translate customer requests and inquiries into appropriate "events" such as, the creation of an order or trouble ticket or the adjustment of a bill. This process logs customer contacts, directs inquiries to the appropriate party, and tracks the status to completion. In those cases where customers are given direct access to service management systems, this process assures consistency of image across systems, and security to prevent a customer from harming their network or those of other customers. The aim is to provide meaningful and timely customer contact experiences as frequently as the customer requires.

Detail Description Paragraph:

[0240] FIG. 1C-1 is a flowchart illustrating a Customer Interface Management Process in accordance with a preferred embodiment. First, in step 158, a service level agreement is received for a hybrid network customer. Next, in step 160, the service level agreement is stored after which, in step 162, inquiries are received from network customers reflecting occurrences related to the hybrid network. Thereafter, in step 164, events are generated based on the customer inquiries and the service level agreement.

Detail Description Paragraph:

[0241] The Network Data Management 130 and Customer Interface Management process 132 are used to give information to the Customer Quality of Service Management Process 134, as shown in FIG. 1D. The Customer Quality of Service Management Process 134 encompasses monitoring, managing and reporting of quality of service as defined in Service Descriptions, Service Level Agreements (SLA), and other service-related documents. It includes network performance, but also performance across all of service parameters, e.g., Orders Completed On Time. Outputs of this process are standard (predefined) and exception reports, including; dashboards, performance of a service against an SLA, reports of any developing capacity problems, reports of customer usage patterns, etc. In addition, this process responds to performance inquiries from the customer. For SLA violations, the process supports notifying Problem Handling and for QoS violations, notifying Service Quality Management 136. The aim is to provide effective monitoring. Monitoring and reporting must provide SP management and customers meaningful and timely performance information across the parameters of the services provided. The aim is also to manage service levels that meet specific SLA commitments and standard service commitments.

Detail Description Paragraph:

[0242] FIG. 1D-1 is a flowchart illustrating a Customer Quality of Service Management Process in accordance with a preferred embodiment. First, in step 166, a hybrid network event is received which may include customer inquiries, required reports, completion notification, quality of service terms, service level agreement terms, service problem data, quality data, network performance data, and/or network configuration data. Next, in step 168, the system determines customer reports to be generated and, in step 170, generates the customer reports accordingly based on the event received.

Detail Description Paragraph:

[0247] This process also encompasses taking appropriate action to keep service levels within agreed targets for each service class and to either keep ahead of demand or alert the sales process to slow sales. The aim is to provide effective service specific monitoring, management and customers meaningful and timely performance information across the parameters of the specific service. The aim is also to manage service levels to meet SLA commitments and standard commitments for the specific service.

Detail Description Paragraph:

[0248] FIG. 1E-1 is a flowchart illustrating a Service Quality Management Process in accordance with a preferred embodiment. First, in step 172, a hybrid network event is received that may include forecasts, quality objectives, available capacity, service problem data, quality of service violations, performance trends, usage trends, problem trends, maintenance activity, maintenance progress, and/or credit violations. Next, in step 174, quality management network data is determined and, in step 176, the quality management network data is generated. Such quality management network data may include constraint data, capacity data, service class quality data, service modification recommendations, additional capacity requirements, performance requests, and/or usage requests. Finally, in step 178, a network process to which to send the generated data is identified.

Detail Description Paragraph:

[0249] FIG. 1F shows a block diagram of the Problem Handling Process 138. The Problem Handling Process receives information from the Customer Interface Management Process 132 and the Customer Quality of service Management Process 134. It is responsible for receiving service complaints from customers, resolve them to the customer's satisfaction and provide meaningful status on repair or restoration activity. This process is also responsible for any service-affecting problems, including

Detail Description Paragraph:

[0250] notifying the customer in the event of a disruption (whether reported by the customer or not),

Detail Description Paragraph:

[0251] resolving the problem to the customer's satisfaction, and

Detail Description Paragraph:

[0253] This proactive management also includes planned maintenance outages. The aim is to have the largest percentage of problems proactively identified and communicated to the customer, to provide meaningful status and to resolve in the shortest timeframe.

Detail Description Paragraph:

[0255] The Problem Handling Process 138 and the Network Data Management 130 feed information to the Rating and Discounting Process 140, as shown in FIG. 1G. This process applies the correct rating rules to usage data on a customer-by-customer basis, as required. It also applies any discounts agreed to as part of the Ordering Process, for promotional discounts and charges, and for outages. In addition, the Rating and Discounting Process 140 applies any rebates due because service level agreements were not met. The aim is to correctly rate usage and to correctly apply discounts, promotions and credits.

Detail Description Paragraph:

[0256] FIG. 1G-1 is a flowchart illustrating Rating and Discounting Process in accordance with a preferred embodiment. First, in step 185, hybrid network customer usage information is received. In step 186, network service level agreement violations are collected, and, in step 187, network quality of service violations are received by the Rating and Discounting system. Next, in step 188, rating rules are applied to the network customer usage information. Further, in step 189, negotiated discounts are determined based on the network quality of service violations and, in step 190, rebates are determined based on the network service level agreement violations. Thereafter, in step 191, billing data reflecting the usage information, the negotiated discounts, and the rebates is provided to generate a customer invoice.

Detail Description Paragraph:

[0257] Utilizing information from the Rating and Discounting Process 140, the

Invoice and Collections Process 142, as shown in FIG. 1H, creates correct billing information. This process encompasses sending invoices to customers, processing their payments and performing payment collections. In addition, this process handles customer inquiries about bills, and is responsible to resolve billing problems to the customer's satisfaction. The aim is to provide a correct bill and, if there is a billing problem, resolve it quickly with appropriate status to the customer. An additional aim is to collect money due the service provider in a professional and customer supportive manner.

Detail Description Paragraph:

[0258] FIG. 1H-1 is a flowchart illustrating an Invoice and Collections Process in accordance with a preferred embodiment. First, in step 192, customer account inquiries and customer payment information is received by the system. Next, in step 193, billing data, including discounts due to quality of service violations and rebates due to service level agreement violations, is collected and processed. Thereafter, in step 194, customer account invoices are created for distribution based on the customer payment information and the billing data.

Detail Description Paragraph:

[0259] Mediation and activity tracking are provided by the event logger and event manager. The event logger and event manager feed the rating and billing information for degraded service using the personally customized rules database. Utilizing an expert system for the tailored capabilities of each customer, the event driver, collector and manager analyze notification events generated by the system. When a notification event is received the system analyzes the event and uses it to identify the customer. The notification event is also used to credit the customer if they experience a non-impacting event that breaches the customer's contract. In addition to the system itself generating the notification event, the customer is also able to notify the provider directly should such an event occur.

Detail Description Paragraph:

[0260] FIG. 2A is a flowchart illustrating media communication over the hybrid network of the present invention. When a customer initiates a use of the hybrid network, the hybrid network, in a first step 220, transfers the media over the network using IP information to route it to the appropriate destination. The media transferred over the network may be telephony data, image data, or any other data capable of packet switched transmission.

Detail Description Paragraph:

[0261] In a second step 222, events are generated based on the quality of service of the media transfer. As discussed above with reference to FIG. 1D and FIG. 1E, these events include performance notifications due to SLA violations, and customer generated events from the Customer Interface Management Process 132.

Detail Description Paragraph:

[0262] In a third step 224, the events generated in step 222 are utilized to generate a bill for the customer. In addition to normal billing for service provided via the hybrid network, the bill is modified based on events generated during the media transfer. For example, events representing SLA violations are used to credit customers. As discussed above with reference to FIG. 1F, 1G, and 1H, the Problem Handling Process 138 is responsible for receiving service complaints and other service-affecting problems. Together with the Network Data Management 130, the Problem Handling Process feeds data to the Discounting Process 140. The Discounting Process 140 applies the correct rating rules on a customer-by-customer basis, and applies discounts for events, such as outages and other SLA violations. Finally, the Invoice and Collections Process 142, utilizes the information from the Discounting Process 140 to create customer billing information.

Detail Description Paragraph:

[0264] Contemporary telecommunication networks provide customers with the

capability of using the general public network as well as the capability of defining a custom virtual network (VNet). With a VNet, a customer defines a private dialing plan, including plan telephone numbers. A VNet customer is not limited to the default telephone numbers allocated to a public telecommunication system dedicated to a specific geographic region, but can define custom telephone numbers.

Detail Description Paragraph:

[0291] The CDR and PNR, and thereby the ECDR and EPNR, are standard call record formats and contain information regarding a typical telephone call as it passes through a switch. The CDR is used for a non-VNET customer, whereas the PNR is used for a VNET customer and is generated at switches that originate VNET calls. The fields of these two records are identical except for some field-specific information described below.

Detail Description Paragraph:

[0292] The OSR and POSR, and thereby the EOSR and EPOS, contain information regarding a telephone call requiring operator assistance and are generated at switches or systems actually equipped with operator positions. A switch completes an OSR for a non-VNET customer and completes a POSR for a private VNET customer. These records are only generated at switches or systems that have the capability of performing operator services or network audio response system (NARS) functions. The formats of the two (2) records are identical except for some field-specific information described below.

Detail Description Paragraph:

[0295] The first check 804 determines if the call is involved in a direct termination overflow (DTO) at the current switch 106-110. For example, a DTO occurs when a customer makes a telephone call 802 to an 800 number and the original destination of the 800 number is busy. If the original destination is busy, the switch overflows the telephone call 802 to a new destination. In this case, the switch must record the originally attempted destination, the final destination of the telephone call 802, and the number of times of overflow. Therefore, if the call 802 is involved in a DTO, the switch 106-110 must complete an expanded record (ECDR, EPNR, EOSR, EPOS) 816.

Detail Description Paragraph:

[0303] The ninth, and final, check 824 made on a call 802 by a switch 106-110 determines if the call 802 is an enhanced voice service/network audio response system (EVS/NARS) call. An EVS/NARS is an audio menu system in which a customer makes selections in response to an automated menu via her telephone key pad. Such a system includes a NARS switch on which the audio menu system resides. Therefore, during an EVS/NARS call 802, the NARS switch 106-110 records the customer's menu selections in an expanded record (EOSR, EPOS) 832.

Detail Description Paragraph:

[0354] Referring again to step 1202, if the originating trunk group type is not an IMT or RLT, the current switch proceeds to step 1204. In step 1204, the current switch determines if the originating trunk group type is an Integrated Services User Parts Direct Access Line (ISUP DAL) or an Integrated Services Digital Network Primary Rate Interface (ISDN PRI). ISUP is a signaling protocol which allows information to be sent from switch to switch as information parameters. An ISUP DAL is a trunk group that primarily is shared by multiple customers of the network, but can also be dedicated to a single network customer. In contrast, an ISDN PRI is a trunk group that primarily is dedicated to a single network customer, but can also be shared by multiple network customers. A network customer is an entity that leases network resources. In step 1204, if the current switch determines that the trunk group type is not an ISUP DAL or ISDN PRI, the current switch proceeds to step 1206. When in step 1206, the current switch knows that it received an NCID that was not generated by a switch that is part of the telecommunication network or

by a switch that is a customer of the network. Therefore, in step 1206, the current switch discards the received NCID because it is an unreliable NCID. From step 1206, the current switch exits step 1110, thereby continuing to step 1114 in FIG. 11 where the current switch will create a new NCID and transport that NCID with the call 202.

Detail Description Paragraph:

[0355] Referring back to step 1204, if the current switch determines that the originating trunk group type is an ISUP DAL or ISDN PRI, the current switch continues to step 1208. When in step 1208, the current switch knows that it received an NCID from a customer trunk group. Therefore, the current switch analyzes the originating trunk group parameters to determine whether it is authorized to create a new NCID for the call 202. The current switch may be authorized to create a new NCID and overwrite the NCID provided by the customer to ensure that a valid NCID corresponds to the call 202 and is sent through the network. In step 1208, if the current switch is not authorized to create a new NCID for the call 202, the current switch proceeds to step 1210. In step 1210, the current switch checks the validity of the received NCID, for example, the NCID length. If the received NCID is invalid, the current switch proceeds to step 1206. In step 1206, the current switch discards the invalid NCID. From step 1206, the current switch exits step 1110, thereby continuing to step 1114 in FIG. 11 where the current switch will create a new NCID and transport that NCID with the call 202.

Detail Description Paragraph:

[0358] FIG. 13B illustrates the control logic for step 1115 which adds a received NCID to the call record associated with the call 202. Upon entering step 1115, the current switch enters step 1306. When in step 1306, the current switch knows that it has received a valid NCID from an intermediate or terminating switch, or from a customer switch. In step 1306, the current switch determines if the AuthCode field of the 32-word call record is available for storing the NCID. If the AuthCode field is available, the current switch proceeds to step 1310. In step 1310, the current switch stores the NCID in the AuthCode field of the 32-word call record. The current switch must also set the NCID Location field to the value '1' which indicates that the NCID is stored in the AuthCode field. After step 1310, the current switch exits step 1115 and continues to step 1136 in FIG. 11 where the current switch writes the call record to the local switch database.

Detail Description Paragraph:

[0366] Referring again to step 1404, if the current switch determines that the terminating trunk is not an ISUP, the current switch proceeds to step 1406. In step 1406, the current switch determines if the terminating trunk group is an ISDN trunk (the terminating trunk group is dedicated to one network customer). If the terminating trunk group is an ISDN, the current switch proceeds to step 1410. In step 1410, the current switch analyzes the parameters associated with the ISDN trunk group type to determine whether or not to deliver the NCID to the next switch. If the current switch is authorized to deliver the NCID, the current switch proceeds to step 1414. In step 1414, the current switch transports the call to the next switch along with a setup message. The setup message contains setup information for the next switch which prepares the next switch to accept and complete the call 202. The NCID is transported as part of the locking shift codeset 6 parameter of the setup message. The format of the locking shift codeset 6 parameter is shown below in Table 307:

Detail Description Paragraph:

[0383] The International Telecommunication Union-Telecommunication Standardization Sector ("ITU-T") has established numerous standards governing protocols and line encoding for telecommunication devices. Because many of these standards are referenced throughout this document, summaries of the relevant standards are listed below for reference.

Detail Description Paragraph:

[0429] IP Routers are also computers that connect networks and is a newer term preferred by vendors. These routers must make decisions as to how to send the data packets it receives to its destination through the use of continually updated routing tables. By analyzing the destination network address of the packets, routers make these decisions. Importantly, a router does not generally need to decide which host or end user will receive a packet; instead, a router seeks only the destination network and thus keeps track of information sufficient to get to the appropriate network, not necessarily the appropriate end user. Therefore, routers do not need to be huge supercomputing systems and are often just machines with small main memories and little disk storage. The distinction between gateways and routers is slight, and current usage blurs the line to the extent that the two terms are often used interchangeably. In current terminology, a gateway moves data between different protocols and a router moves data between different networks. So a system that moves mail between TCP/IP and OSI is a gateway, but a traditional IP gateway (that connects different networks) is a router.

Detail Description Paragraph:

[0459] In an alternative embodiment, a conference call without callback leg is enabled. In this embodiment, a callback customer participates through a Voice Over Network (VON) application utilizing a computer with voice capability, and can initiate a video screen popup on the computer display for manual operator assistance as detailed above in the description of a video operator.

Detail Description Paragraph:

[0511] In a sensing step 1606, the Proactive Threshold Manager senses the current level of service which is being provided to customers. Protocol converters assist the Proactive Threshold Manager in communicating with various components of the system. Protocol converters are able to translate information between the packet-switched an circuit-switched system components, thus allowing the Proactive Threshold Manager to communicate with all the components of the hybrid system.

Detail Description Paragraph:

[0533] Customer Support Structure

Detail Description Paragraph:

[0534] The organization model for customer service support in the NGN network provides a single point of contact that is customer focused. This single point of contact provides technical expertise in resolving customer incidents, troubles and requests. Generally a three tiered support structure is greatly increases customer satisfaction in service needs. Each tier, or level, possess an increased level of skill, with tasks and responsibilities distributed accordingly.

Detail Description Paragraph:

[0535] FIG. 18 is a flowchart showing a Three Tiered Customer Support Process 1800 in accordance with a preferred embodiment of the present invention. The Three Tiered Customer Support Process 1800 begins with a First Tier step 1802. In step 1802, a customer with a hybrid network problem is provided access to customer support personnel having a broad set of technical skills. The broad set of technical skills allows this group to solve about 60-70% of all hybrid network problems. If the customers network problem is solved at this stage, the process ends. However, if the customers network problem is not solved at this stage, the process continues to a Second Tier step 1804.

Detail Description Paragraph:

[0536] In the Second Tier step 1804, the customer is provided access to technical experts and field support personnel who may specialize in specific areas. The greater specialized nature of this group allows it to solve many problems the group in step 1802 could not solve. This group is generally responsible for solving 30-

40% of all hybrid network problems. If the customers network problem is solved at this stage, the process ends. However, if the customers network problem is not solved at this stage, the process continues to a Third Tier step 1806.

Detail Description Paragraph:

[0537] In the Third Tier step 1806, the customer is provided access to solution experts who are often hardware vendors, software vendors, or customer application development and maintenance teams. Customer network problems that get this far in the customer support process 1800 need individuals possessing in-depth skills to investigate and resolve the difficult problems with there area of expertise. Solution experts are the last resort for solving the most difficult problems. Typically this group solves about 5% of all hybrid network problems.

Detail Description Paragraph:

[0538] The above model is generally referred to as the Skilled Model because personnel at all three tiers are highly skilled. This model generally creates a high percentage of calls resolved on the first call. Other approaches include a Functional Model, and a Bypass Model. In the Functional Model users are requested to contact different areas depending on the nature of the incident. Calls are routed to the customer support representative best able to handle the call. This model can easily be coupled with the Skill Model above. In the Bypass Model First Tier only logs calls, they do not resolve calls. One advantage of this model is that skilled resources don't have to waste time logging calls.

Detail Description Paragraph:

[0539] In more detail, a customer calling a customer support center in accordance with one embodiment of the present invention is first asked a series of questions by an interactive voice response (IVR) system or an live operator. The customer uses Touch-Tone keys on the telephone to respond to these queries from the IVR, or responds normally to a live operator.

Detail Description Paragraph:

[0541] After reviewing the situation with the customer, the product support engineer can query the customer's computer via support agents for additional information, if necessary.

Detail Description Paragraph:

[0542] In systems according to the preferred embodiment, the customer spends less time interacting with a product support engineer, and is relieved of many of the responsibilities in diagnosing and resolving problems. Automated diagnoses and shorter customer interactions save the product support center time, resources, and money. At the same time, the customer receives a better diagnosis and resolution of the problem than could usually be achieved with prior art product support techniques.

Detail Description Paragraph:

[0544] The Internet access software accesses and "handshakes" with an "Internet Entry Server", which verifies the PIN number, provides the access and times the user's access time. The Internet Entry Server is programmed to recognize the PIN number as entitling the user to a limited prepaid or "free" Internet access time for on-line help services. Such a time period could be for a total time period such as 1 hour or more, or access to on-line help services can be unlimited for 90 days, 6 months, etc., for example, with the access time paid for by the sponsor/vendor. The first time a customer uses the on-line help service, the Internet Entry Server performs a registration process which includes a number of personal questions and custom data gathering in the form of queries provided by the sponsor/vendor for response by the user.

Detail Description Paragraph:

[0545] The pertinent answers are then immediately provided to the sponsor/vendor.

The Internet Entry Server then "hot-links" the customer to the sponsor/vendor's Internet domain or Home Page for a mandatory "guided tour" where the user is exposed to any current product promotion by the sponsor/vendor and can download promotional coupons, product information, etc. After this mandatory guided tour is completed, the customer is allowed to enter queries for help in installing or using the sponsor/vendor's product. As an optional promotional service, upon termination of the on-line help session, access to other information on the Internet can be provided. Once the "free" on-line help service time or time period is up, the Internet Entry Server prompts the user with one or more of a plurality of options for extending the availability of on-line help. For example, the user can be prompted to enter a credit card number to which on-line help charges can be charged; he or she can be given the opportunity to answer additional survey information in return for additional "free" on-line help; or a 900 subscriber paid telephone access number can be provided through which additional on-line help will be billed via the normal telephone company 900 billing cycles.

Detail Description Paragraph:

[0560] In a model building step 2004, the system builds a model of the network behavior based on the patterns and correlations identified in step 2002. Data mining is a process that uses specific techniques to find patterns in data, allowing a user to conduct a relatively broad search of large databases for relevant information that may not be explicitly stored in the databases. Typically, a user initially specifies a search phrase or strategy and the system then extracts patterns and relations corresponding to that strategy from the stored data. Such a search system permits searching across multiple databases. The extracted patterns and relations can be: (1) used by the user, or data analyst, to form a prediction model; (2) used to refine an existing model; and/or (3) organized into a summary of the target database, as in predicting step 2006.

Detail Description Paragraph:

[0562] Finally, in a managing step 2008, the network is managed based on the future behavior of the network. Data mining involves the development of tools that analyze large databases to extract useful information from them. As an application of data mining, customer purchasing patterns may be derived from a large customer transaction database by analyzing its transaction records. Such purchasing habits can provide invaluable marketing information. For example, retailers can create more effective store displays and more effective control inventory than otherwise would be possible if they know consumer purchase patterns. As a further example, catalog companies can conduct more effective mass mailings if they know that, given that a consumer has purchased a first item, the same consumer can be expected, with some degree of probability, to purchase a particular second item within a defined time period after the first purchase.

Detail Description Paragraph:

[0564] As an example, consider the case where a credit card company which has a large database on its card holders and wants to develop a profile for each customer class that will be used for accepting or rejecting future credit applicants. Assuming that the card holders have been divided into two classes, good and bad customers, based on their credit history. The problem can be solved using classification. First, a training set consisting of customer data with the assigned classes are provided to a classifier as input. The output from the classifier is a description of each class, i.e., good and bad, which then can be used to process future credit card applicants. Similar applications of classification are also found in other fields such as target marketing, medical diagnosis, treatment effectiveness, and store location search.

CLAIMS:

1. A method for managing customer quality of service in a hybrid network architecture, comprising the steps of: a) receiving a hybrid network event selected

from the group of events consisting essentially of customer inquiries, required reports, completion notification, quality of service terms, service level agreement terms, service problem data, quality data, network performance data, and network configuration data; b) determining customer reports to be generated; and c) generating the customer reports based on the hybrid network event received.

2. A method as recited in claim 1, wherein the customer report is a planning report.

3. A method as recited in claim 1, wherein the customer report is a service level violation report.

4. A method as recited in claim 1, wherein the customer report is a quality of service violation report.

7. A method as recited in claim 1, wherein the received event includes a customer inquiry.

8. A system for managing customer quality of service in a hybrid network architecture, comprising: a) logic that receives a hybrid network event selected from the group of events consisting essentially of customer inquiries, required reports, completion notification, quality of service terms, service level agreement terms, service problem data, quality data, network performance data, and network configuration data; b) logic that determines customer reports to be generated; and c) logic that generates the customer reports based on the hybrid network event received.

9. A system as recited in claim 8, wherein the customer report is a planning report.

10. A system as recited in claim 8, wherein the customer report is a service level violation report.

11. A system as recited in claim 8, wherein the customer report is a quality of service violation report.

14. A system as recited in claim 8, wherein the received event includes a customer inquiry.

15. A computer program embodied on a computer readable medium for managing customer quality of service in a hybrid network architecture, comprising: a) a code segment that receives a hybrid network event selected from the group of events consisting essentially of customer inquiries, required reports, completion notification, quality of service terms, service level agreement terms, service problem data, quality data, network performance data, and network configuration data; b) a code segment that determines customer reports to be generated; and c) a code segment that generates the customer reports based on the hybrid network event received.

16. A computer program as recited in claim 15, wherein the customer report is a planning report.

17. A computer program as recited in claim 15, wherein the customer report is a service level violation report.

18. A computer program as recited in claim 15, wherein the customer report is a quality of service violation report.

21. A computer program as recited in claim 15, wherein the received event includes a customer inquiry.

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L13 and (customer near usage)

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<u>L14</u>	L13 and (customer near usage)	35	<u>L14</u>
<u>L13</u>	L12 and (customer)	125	<u>L13</u>
<u>L12</u>	L11 and summary	129	<u>L12</u>
<u>L11</u>	L10 and usage	137	<u>L11</u>
<u>L10</u>	L8 and (billing near data)	220	<u>L10</u>
<u>L9</u>	L8 and ((billing near data) same (customer near usage))	19	<u>L9</u>
<u>L8</u>	calling near card	2569	<u>L8</u>
<u>L7</u>	L6 and (customer near usage)	0	<u>L7</u>
<u>L6</u>	L4 and (billing near data)	15	<u>L6</u>
<u>L5</u>	L4 and ((billing near data) same (customer near usage))	0	<u>L5</u>
<u>L4</u>	calling near card near system	138	<u>L4</u>
<u>L3</u>	L2 and (search\$ or quer\$)	33	<u>L3</u>
<u>L2</u>	L1 and (customer near usage)	35	<u>L2</u>
<u>L1</u>	(calling near card) and (billing near data)	220	<u>L1</u>

END OF SEARCH HISTORY